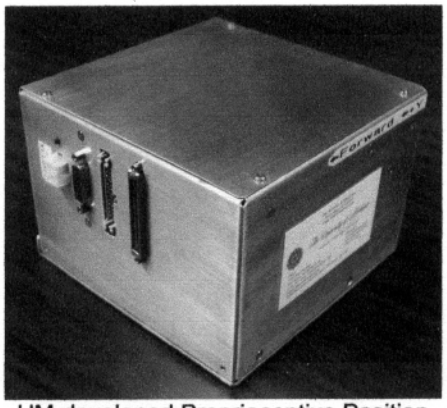
No GPS? – No Problem!

The University of Michigan (UM) is offering prospective contestants in the *DARPA Grand Challenge* its newly developed **High-accuracy Proprioceptive Position Estimation (PPE) system**.

Our PPE system uses high-quality fiber-optic gyroscopes and our unique Fuzzy Logic Expert Navigation (FLEXnav) software to provide unparalleled dead-reckoning accuracy for mobile robots. **We claim that our PPE is the most accurate dead-reckoning system available for mobile robots.** It works equally well on smooth and rugged terrain (see example of experimental results below). Like all dead-reckoning systems, ours is designed to provide position estimation for a finite amount of time while absolute positioning data (e.g., GPS) is unavailable. Typically our system provides excellent data for up to 10 minutes before its accuracy degrades gradually to values below specifications. At any time our system's accuracy can be restored by an absolute position measurement (e.g., by one or two good GPS readings).



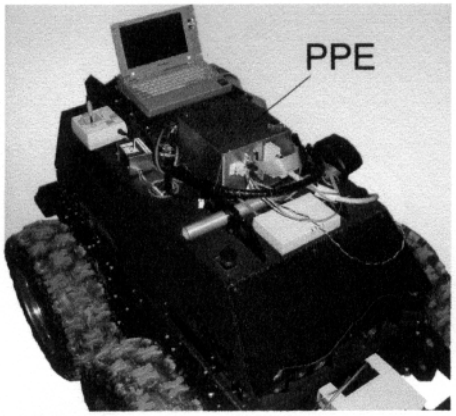
UM-developed Proprioceptive Position Estimation (PPE) system gives unprecedented accuracy – we guarantee it!

Under development now for over five years with funding from DARPA, NASA, and DOE, our PPE has reached a level of maturity that makes it suitable for installation on any mobile robot with wheel encoder output.

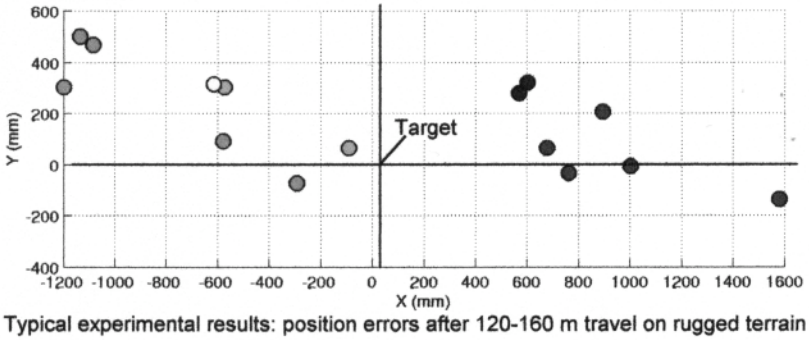
We offer our system to prospective contestants in the *DARPA Grand Challenge* for an all-inclusive fee of $16,000. This fee includes all hardware (i.e., gyros, accelerometers, PC/104 embedded computer), software, one-time on-site installation on the contestant's mobile robot and unlimited technical support until the completion of the Grand Challenge event. We guarantee your satisfaction or (part of) your money back (see below).

Should contestant win the Grand Challenge, we waive all claims to any portion of DARPA's price money, but we ask to retain bragging rights, and we request acknowledgement of our contribution in contestant's publications pertaining to the DARPA Grand Challenge.

We preserve the right to collaborate with more than one contestant.



UM's PPE system installed on an ATRV robot at Carnegie Mellon University for objective testing outside of our lab.



Typical experimental results: position errors after 120-160 m travel on rugged terrain

Key Specifications:

Typical positioning error < 1.0% of total travel distance on rugged terrain

Instrumentation: 3 precision-calibrated KVH fiberoptic gyros, 2 accelerometers

Size: ~6.5"L x 6.6"W x 5.0"H

Weight: ~4.4 lbs

Power: ~28 Watt

Brain: PC/104

Unique UM-developed Fuzzy Logic Expert navigation (FLEXnav) software

This is how our Satisfaction Guarantee works:

1. Contestant pays us upfront $8,000 to cover the cost of the instruments (KVH fiber optic gyros and accelerometers) as well as PC/104 components, other hardware, and travel to contestant's site for installation of our system.
2. After installation of our hardware and our FLEXnav 30-day trial software on contestant's mobile robot is completed, payment of the second and final installment of $8,000 is due within 30 days but only if contestant is satisfied with the performance of our system.
3. If contestant is dissatisfied with our system, contestant makes no second payment and can keep the PPE hardware (KVH fiber optic gyros, accelerometers) as well as all PC/104 components, that we purchased with the initial $8,000, but we will not refund the initial $8,000 to contestant.

For more information contact:

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